APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/760,652	01/20/2004	Gregory Edward Tierney	200313614-1	9868

22879   7590   03/22/2010
HEWLETT-PACKARD COMPANY
Intellectual Property Administration
3404 E. Harmony Road
Mail Stop 35
FORT COLLINS, CO 80528

EXAMINER
CHERY, MARDOCHEE

ART UNIT	PAPER NUMBER
2186	

NOTIFICATION DATE	DELIVERY MODE
03/22/2010	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

JERRY.SHORMA@HP.COM
ipa.mail@hp.com
laura.m.clark@hp.com

	Application No.	Applicant(s)
	10/760,652	TIERNEY ET AL.
Office Action Summary	Examiner	Art Unit	
	MARDOCHEE CHERY	2186	

-- *The MAILING DATE of this communication appears on the cover sheet with the correspondence address --*

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE <u>3</u> MONTH(S) OR THIRTY (30) DAYS,
WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.
- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed
  after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
  Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any
  earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on <u>13 August 2009</u>.

2a)☒ This action is **FINAL.**   2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is
   closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) <u>1-35</u> is/are pending in the application.

    4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) <u>1-34</u> is/are rejected.

7)☒ Claim(s) <u>35</u> is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a)☐ All   b)☐ Some * c)☐ None of:

      1.☐ Certified copies of the priority documents have been received.

      2.☐ Certified copies of the priority documents have been received in Application No. _____.

      3.☐ Copies of the certified copies of the priority documents have been received in this National Stage
        application from the International Bureau (PCT Rule 17.2(a)).

    * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1)☐ Notice of References Cited (PTO-892)

2)☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3)☒ Information Disclosure Statement(s) (PTO/SB/08)
    Paper No(s)/Mail Date <u>8/13/09</u>.

4)☐ Interview Summary (PTO-413)
    Paper No(s)/Mail Date. _____

5)☐ Notice of Informal Patent Application

6)☐ Other: _____.

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1.   A request for continued examination under 37 CFR 1.114 was filed in this

application after appeal to the Board of Patent Appeals and Interferences, but prior to a

decision on the appeal. Since this application is eligible for continued examination

under 37 CFR 1.114 and the fee set forth in 37 CFR 1.17(e) has been timely paid, the

appeal has been withdrawn pursuant to 37 CFR 1.114 and prosecution in this

application has been reopened pursuant to 37 CFR 1.114. Applicant's submission filed

on August 13, 2009 has been entered.

2.   All claims are drawn to the same invention claimed in the application prior to the

entry of the submission under 37 CFR 1.114 and could have been finally rejected on the

grounds and art of record in the next Office action if they had been entered in the

application prior to entry under 37 CFR 1.114. Accordingly, **THIS ACTION IS MADE**

FINAL even though it is a first action after the filing of a request for continued

examination and the submission under 37 CFR 1.114. See MEPP § 706.07(b).

Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

        A shortened statutory period for reply to this final action is set to expire THREE

MONTHS from the mailing date of this action. In the event a first reply is filed within

TWO MONTHS of the mailing date of this final action and the advisory action is not

mailed until after the end of the THREE-MONTH shortened statutory period, then the

shortened statutory period will expire on the date the advisory action is mailed, and any

extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of

the advisory action. In no event, however, will the statutory period for reply expire later

than SIX MONTHS from the mailing date of this final action.

Response to Amendment

3.   No amendment has been filed. On March 18, 2008, Appellants filed a Notice of

Appeal. However, on August 13, 2009, Appellants filed a Request for Continued

Examination (RCE) under 37 C.F.R. 1.114. The RCE is treated as a request to withdraw

the appeal.

Response to Arguments

4.   No arguments/remarks have been filed. Appellants' submission is in the form of

Information Disclosure statements (IDSs) filed on August 13, 2009. Thus, the claims

stand rejected and will be treated as in the Office action dated March 13, 2007.

Claim Rejections - 35 USC § 103

5.   The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all

obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set
> forth in section 102 of this title, if the differences between the subject matter sought to be patented and
> the prior art are such that the subject matter as a whole would have been obvious at the time the
> invention was made to a person having ordinary skill in the art to which said subject matter pertains.
> Patentability shall not be negatived by the manner in which the invention was made.

6.   Claims 1-6, 8-9, and 13 are rejected under 35 U.S.C. 103(a) as being

unpatentable over Cypher (2004/0002992) in view of Hum (6,922,756).

As per claim 1, Cypher discloses a system comprising: a first node operative to provide a source broadcast requesting data [Fig. 2A, ¶¶ 7, ll 1-7], the first node associating an F-state with a copy of the data in response to receiving the copy of the data from memory and receiving non-data responses from other nodes in the system [¶¶ 7, ll 7-13; ¶¶ 8, ll 9-14; ¶¶ 68, ll 4-22], the non-data responses including an indication that at least a second node includes a shared copy of the data [¶¶ 68; ll 1-11], the F-state enabling the first node to serve as an ordering point in the system [Fig. 1; ¶¶ 75-76].

As per claim 1, Cypher may not explicitly teach an F-state capable of responding to requests from the other nodes in the system with a shared copy of the data.

Hum discloses an F-state capable of responding to requests from the other nodes in the system with a shared copy of the data [col. 3, ll 6-11; col. 5, ll 66 to col. 6, ll 1] to permit a shared data to be transmitted from the current owning system component to the requesting system component without any concern of multiple data copies received at the requesting system component [col. 3, ll 7-9].

Thus, it would have been obvious to one of ordinary skill in the art at the time of invention by Applicant to modify the system of Cypher to include an F-state capable of responding to requests from the other nodes in the system with a shared copy of the data because this would have permitted a shared data to be transmitted from the current owning system component to the requesting system component without any concern of multiple data copies received at the requesting system component [col. 3, ll 7-9] as taught by Hum.

As per claim 2, Cypher discloses the non-data responses further comprise an indication that the other nodes in the system do not have a copy of the data requested by the first node [¶¶. 69].

As per claim 3, Cypher discloses the source broadcast requesting the data comprises a non-ownership request for the data [Fig. 4; ¶¶ 68; ll 1-9].

As per claim 4, Cypher discloses the non-ownership request comprises a source broadcast read request [¶¶. 7; ll 1-3, 10-16; ¶¶ 68].

As per claim 5, Cypher discloses the first node comprises a first processor having an associated cache that comprises plurality of cache lines, one of the cache lines having an address associated with the copy of data received from memory and state data that defines the state of the data stored in the one of the cache lines [Fig. 4].

As per claim 6, Cypher discloses the first processor further comprises a cache controller that controls the state of the data stored in the plurality of cache lines [Fig. 2A].

As per claim 8, Cypher discloses each node defines a processor having an associated cache that comprises a plurality of cache lines, each cache line having a

respective address that identifies associated data and state information that indicates a

state of the associated data for the respective cache line, each of the processors being

capable of communicating with each other via an interconnect [Fig. 2A].

As per claim 9, Cypher discloses a cache controller associated with each cache

for managing data requests and responses for the respective cache [Fig. 2A; *Controllers*

210A-210B].

As per claim 13, Cypher discloses the ordering point defined by the F-state

migrates from the first node to another node in response to the another node issuing a

source broadcast non-ownership request for a copy of the data [pars. 75-76; Fig. 1].

7.   Claims 7 and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over

Cypher (2004/0002992) in view of Hum (6,922,756) and further in view of Hum

(2004/0123047).

As per claim 7, Hum discloses the cache controller is capable of evicting the data

stored in the one of the cache lines by modifying the state information from the F-state

to an invalid state for the data [Abstract; col. 5, ll 57-65].

However, Cypher and Hum may not explicitly teach silently evicting the data

stored in the one of the cache lines.

Hum (2004/0123047) discloses silently evicting the data stored in the one of the cache lines [par. 65, ll 6-8] so the agent may not be aware that all copies have been evicted (par. 65, ll 7-10).

Thus, it would have been obvious to one of ordinary skill in the art at the time of invention by Applicant to modify the system of Cypher and Hum (756) to include silently evicting the data stored in the one of the cache lines because this would have enabled the agent to not be aware that all copies have been evicted (par. 65, ll 7-10) as taught by Hum (047).

As per claim 10, the rationale in the rejection 7 is herein incorporated.

8.   Claims 11, 12, 14-15, 17-34 are rejected under 35 U.S.C. 103(a) as being unpatentable over Cypher (2004/0002992) in view of Hum (6,922,756) and further in view of Arimilli (6,138,218).

As per claim 11, Cypher and Hum (756) disclose the claimed invention as discussed above in the previous paragraphs. However, Cypher and Hum (756) may not explicitly teach the system implements a source broadcast protocol to process requests and responses provided by nodes within the system, the system transferring to an associated forward progress protocol in response to a request failing in the source broadcast protocol.

Arimilli discloses the system implements a source broadcast protocol to process

requests and responses provided by nodes within the system, the system transferring to

an associated forward progress protocol in response to a request failing in the source

broadcast protocol [col. 6, ll 39-45 and 54-64] to obviate the need for subsequent

interventions (col. 6, ll 48-50).

Thus, it would have been obvious to one of ordinary skill in the art at the time of

invention by Applicant to modify the system of Cypher and Hum (756) to include a

source broadcast protocol to process requests and responses provided by nodes within

the system, the system transferring to an associated forward progress protocol in

response to a request failing in the source broadcast protocol because this would have

helped obviated the need for subsequent interventions (col. 6, ll 48-50) as taught by

Arimilli.

As per claim 12, Arimilli discloses the forward progress protocol comprises a

directory-based protocol [col. 1, ll 35-40].

As per claim 14, the rationale in the rejection of claims 1 and 3 is herein

incorporated.

However, Cypher and Hum (756) may not explicitly teach transitioning from the

first state to a second state indicating that the data is shared; and the second node

transitioning to a third state in response to receiving the shared copy of the data from

the first node, such that the second node becomes an ordering point in the network for

providing a shared copy of the data.

Arimilli discloses transitioning from the first state to a second state indicating that

the data is shared [col. 5, ll 60-67]; and the second node transitioning to a third state in

response to receiving the shared copy of the data from the first node, such that the

second node becomes an ordering point in the network for providing a shared copy of

the data [col. 6, ll 1-15] to make forward progress towards an ultimate state on retried

snoop operations (col. 1, ll 10-15).

Thus, it would have been obvious to one of ordinary skill in the art at the time of

invention by Applicant to modify the system of Cypher and Hum (756) to include

transition from the first state to a second state indicating that the data is shared because

this would have made forward progress towards an ultimate state on retried snoop

operations (col. 1, ll 10-15) as taught by Arimilli.

As per claim 15 the rationale in the rejection of claim 5 is herein incorporated.

As per claim 17 the rationale in the rejection of claim 11 is herein incorporated.

As per claim 18, Cypher discloses the forward progress protocol comprises a

directory-based protocol [par. 7, ll 1-5].

As per claim 19, Arimilli discloses the third state and the second state are the same [col. 3, ll 17-25].

As per claim 20, the rationale in the rejection of claims 1 and 14 is herein incorporated.

As per claim 21, Cypher discloses at least one other processor having an associated cache that does not include a valid copy of the desired data, the at least one other processor responding to the broadcast request with a response indicating that the at least one other processor does not include a valid copy of the desired data [¶¶. 69].

As per claim 23, the rationale in the rejection of claim 3 is herein incorporated.

As per claim 24, the rationale in the rejection of claim 4 is herein incorporated.

As per claim 25, the rationale in the rejection of claim 11 is herein incorporated.

As per claim 26, the rationale in the rejection of claim 20 is herein incorporated.

As per claim 27, Cypher discloses the means for enabling defines an ordering point in the system for responding to non-ownership requests for the data, the system further comprising means for migrating the ordering point from the first node to another

node in the system in response to a non-ownership request for the data provided by the

another node [pars. 75-76].

As per claim 28, the rationale in the rejection of claim 11 is herein incorporated.

As per claim 29, Cypher discloses the memory comprises a home node for the

requested data, the system further comprising means for blocking the home node from

responding with data to another request if the first node provides a response to the

another request that includes a shared copy of the data [Fig. 4; ¶¶ 68; ll 1-9].

As per claim 30, the rationale in the rejection of claim 26 is herein incorporated.

As per claim 31, Hum discloses silently evicting the data from the source node by

modifying the state of the data in the source node to an invalid state [col. 5, ll 57-67].

As per claim 32, Cypher discloses moving the ordering point for the data from the

source node to another node in response to a non-ownership request for the data

provided by the another node [pars. 75-76].

As per claim 33, the rationale in the rejection of claim 5 is herein incorporated.

As per claim 34, the rationale in the rejection of claim 11 is herein incorporated.

9.   Claims 16 and 22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Cypher (2004/0002992) in view of Hum (6,922,756), Arimilli (6,138,218), and further in view of Hum (2004/0123047).

As per claim 16, the rationale in the rejection of claim 10 is herein incorporated.

However, Cypher, Hum, and Arimilli may not explicitly teach silently evicting the data by modifying the state information for the cache line to an invalid state.

Hum (2004/0123047) discloses silently evicting the data stored in the one of the cache lines by modifying the state information for the cache line to an invalid state [par. 65, ll 6-8] so the agent may not be aware that all copies have been evicted (par. 65, ll 7-10).

Thus, it would have been obvious to one of ordinary skill in the art at the time of invention by Applicant to modify the system of Cypher, Hum (756), and Arimilli to include silently evicting the data stored in the one of the cache lines because this would have enabled the agent to not be aware that all copies have been evicted (par. 65, ll 7-10) as taught by Hum (047).

As per claim 22, the rationale in the rejection of claim 16 is herein incorporated.

However, Cypher, Hum, and Arimilli may not explicitly teach silently evicting the data by returning to the first state.

Hum (2004/0123047) discloses silently evicting the data stored in the one of the cache lines by returning to the first state [par. 65, ll 6-8] so the agent may not be aware that all copies have been evicted (par. 65, ll 7-10).

Thus, it would have been obvious to one of ordinary skill in the art at the time of invention by Applicant to modify the system of Cypher and Hum (756) to include silently evicting the data stored in the one of the cache lines because this would have enabled the agent not be aware that all copies have been evicted (par. 65, ll 7-10) as taught by Hum (047).

Allowable Subject Matter

10.   Claim 35 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Conclusion

11.   All claims are drawn to the same invention claimed in the application prior to the entry of the submission under 37 CFR 1.114 and could have been finally rejected on the grounds and art of record in the next Office action if they had been entered in the application prior to entry under 37 CFR 1.114. Accordingly, **THIS ACTION IS MADE FINAL** even though it is a first action after the filing of a request for continued examination and the submission under 37 CFR 1.114. See MPEP § 706.07(b).

Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE

MONTHS from the mailing date of this action. In the event a first reply is filed within

TWO MONTHS of the mailing date of this final action and the advisory action is not

mailed until after the end of the THREE-MONTH shortened statutory period, then the

shortened statutory period will expire on the date the advisory action is mailed, and any

extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of

the advisory action. In no event, however, will the statutory period for reply expire later

than SIX MONTHS from the mailing date of this final action.

12.   Any inquiry concerning this communication or earlier communications from the

examiner should be directed to MARDOCHEE CHERY whose telephone number is

(571)272-4246. The examiner can normally be reached on 8:30A-5:00P.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's

supervisor, Matthew Kim can be reached on (571)272-4182. The fax phone number for

the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the

Patent Application Information Retrieval (PAIR) system. Status information for

published applications may be obtained from either Private PAIR or Public PAIR.

Status information for unpublished applications is available through Private PAIR only.

For more information about the PAIR system, see http://pair-direct.uspto.gov. Should

you have questions on access to the Private PAIR system, contact the Electronic

Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a

USPTO Customer Service Representative or access to the automated information

system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Mardochee Chery/
Examiner, Art Unit 2188

February 28, 2010